

REMARKS

This application has been amended so as to place it in condition for allowance at the time of the next Office Action.

The Office Action rejects claims 1, 2, 5-8, 11, 12, 14, 15, and 22-30 under 35 USC §103(a) as being unpatentable over NIELSEN in view of ROLF et al. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons:

Applicants respectfully suggest that the assertion in the Office Action that the combination of NIELSEN 6,175,096 and WO 96/23624 render obvious the claimed invention is clearly based on hindsight. Indeed, as readily acknowledged in the Office Action (see Office Action on page 2), NIELSEN is silent on the subject of using a gas mixture for cutting stainless steel and the other materials. As explicitly taught by NIELSEN, only pure gases can be used for cutting ordinary steel (specifically, oxygen) and stainless steel (specifically, nitrogen) when using a multiple focus lens (see col. 2, lines 53-56).

If it is true that ROLF et al. teaches the use of nitrogen/oxygen mixtures for laser cutting stainless steels or other steels, and aluminum and its alloys, it should be emphasized that ROLF et al. does not teach or suggest the use of O₂/N₂ mixtures, when cutting with a multiple focus lens.

However, as explained in the specification of the present invention (see, e.g., page 1, lines 30-39 to page 2, lines 1-5; page 4, lines 30-34; and page 5, lines 7-24), the improvement sought to be achieved with respect to the existing laser cutting processes using either a single focus lens, such as that of ROLF et al., or a multiple focus lens, such as that of NIELSEN, was to further improve to the cutting speed, and the gas consumption, without any negative impact on the cut quality.

This problem was solved by the inventors of the present invention by combining, in a novel manner, a multiple focus objective in combination with a particular gas mixture (O₂/N₂) with the aim of cutting particular materials.

Such a combination has never been attempted prior to the present invention, due at least in part to the fact that a skilled artisan would have no motivation whatsoever to combine the teachings of the ROLF et al. and NIELSEN references precisely because they deal with alternative technologies, i.e., NIELSEN teaches how to improve the cutting speed and gas consumption using a multiple focus lens with respect to a single focus lens process, whereas ROLF et al. teaches how to improve the cutting speed and gas consumption, using a N₂/O₂ gas mixture, with respect to pure gas, but only in the context of a single focus lens process.

Furthermore, NIELSEN clearly teaches that, when using a multiple focus lens, only pure gases should be used. Accordingly, this teaches directly away from the present invention as claimed. Were one to start from the perspective of the combination of the references and end up at the present invention, it would be necessary to pursue a path that runs entirely contrary to the teachings of NIELSEN.

Such conclusion is readily supported by the search report of the ROLF et al. reference itself, in which another patent of S.E. NIELSEN is cited, namely US 4,724,297 (the '297 patent). When considering the teachings of the '297 patent, he becomes clear that S.E. NIELSEN first developed in 1988 a laser cutting process of high alloys or stainless steel using a gas mixture containing O₂ and an inert gas such as nitrogen, producing the result of a high cutting speed and no burr. In 1996, when S.E. NIELSEN developed his second process (US 6,175,096), he did not disclose or suggest that N₂/O₂ mixtures can be used with a multiple focus lens in order to further improve the cutting process, the gas consumption, and the quality of the cut.

In other words, despite the fact that NIELSEN was perfectly aware that gas mixtures can be useful in certain circumstances to improve the cutting speed and the cut quality (no burr), he did not mention that in the frame of US '096

(issued approximately eight years after US '297) and, in contrast, advocated in US '096 to use pure gases in combination with a multiple focus lens.

For all these reasons, applicants respectfully suggest that the combination of applied references renders obvious the present invention as claimed only when such references are viewed from the impermissible perspective of hindsight, and accordingly such obviousness rejection is improper and cannot reasonably be maintained.

The Office Action rejects claim 9 under 35 USC §103(a) as being unpatentable over the references applied in the previous obviousness rejection, and further in view of McNEILL. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons:

The additional McNEILL reference is offered merely for its asserted teaching or suggestion of a nitrogen/oxygen mixture obtained from air treated by a membrane system. However, regardless of the ability of the McNEILL reference to teach or suggest that for which it is offered, it fails to overcome the significant shortcomings of the combination of the NIELSEN and ROLF et al. references, as detailed above. Accordingly, applicants respectfully suggest that the combination of three references cannot reasonably be considered as rendering obvious rejected claim 9.

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Consideration of the above analysis is earnestly solicited. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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